WE CLAIM:

1. An actuator responsive to fluid signals to extend and retract a piston, the actuator comprising:

a cylinder;

a pressure piston carried inside the cylinder;

a shaft;

a rod connected to the pressure piston, and the rod to be connected to a device to be moved;

a first port configured to receive a fluid pressure to move the pressure piston to a first position; and

a locking mechanism inside the pressure piston, the locking mechanism including a first surface and a second surface, with both surfaces traveling with the pressure piston along the shaft in response to the fluid pressure at the first port, and the surfaces locking the pressure piston in the first position upon removal of the fluid pressure at the first port.

2. The actuator of Claim 1, further including a second port configured to receive a fluid pressure, and, in response to the fluid pressure at the second port, the surfaces of the locking mechanism unlock and are configured to move along the shaft with the pressure piston to a second position.

3. The actuator of Claim 1, wherein the rod is moveable axially with respect to and concentrically over the shaft.

4. The actuator of Claim 1, wherein the first and second surfaces are axially opposed and axially engageable and disengageable.

5. The actuator of Claim 1, wherein the first surface is on a sleeve rotationally fixed to the shaft.

6. The actuator of Claim 5, wherein the locking mechanism further includes a dowel pin that rotationally fixes the sleeve to the shaft.

7. The actuator of Claim 1, wherein the second surface is on a nut threadably received and rotatable on the shaft.

8. The actuator of Claim 7, wherein the nut is movable axially with respect to the cylinder.

9. The actuator of Claim 5, wherein the sleeve is moveable axially along the shaft.

10. The actuator of Claim 1, wherein the first and second surfaces include teeth.

11. The actuator of Claim 1, wherein the locking mechanism is in a fluid chamber and further includes a moveable element responsive to fluid pressure to vent fluid externally to the pressure piston.

12. The actuator of Claim 11, wherein the moveable element is a multi-diameter shuttle pin.

13. The actuator of Claim 11, wherein the pressure piston includes at least one element having an opening allowing fluid pressure to reach the moveable element.

14. The actuator of Claim 12, wherein the differing diameters of the multi-diameter shuttle pin permits the shuttle pin to connect and disconnect bores in the pressure piston so as to create paths for fluid to flow to the shuttle pin and in and out of the fluid chamber.

15. The actuator of Claim 1, wherein the locking mechanism includes a fluid-filled cavity generally maintaining the first and second surfaces locked, and a venting device responsive to fluid pressure at the first port to vent the cavity and allow the first and second surfaces to unlock.

16. The actuator of Claim 2, wherein the locking mechanism includes a fluid-filled cavity generally maintaining the first and second surfaces locked, and a venting device responsive to fluid pressure at the second port to vent the cavity and allow the first and second surfaces to unlock.

17. The actuator of Claim 15, wherein the venting device includes a multi-diameter shuttle pin.

18. The actuator Claim 16, wherein the venting device includes a multi-diameter shuttle pin.

19. The actuator of Claim 1, wherein the locking mechanism further includes at least one spring biasing the first surface toward the second surface.

20. The actuator of Claim 1, wherein the locking mechanism further includes a thrust bearing assigned to the second surface.

21. The actuator of Claim 20, wherein the thrust bearing further includes plates with races and roller bearings, the thrust bearing configured such that when a force is applied to one plate of the thrust bearing, the nut is assisted in rotating in one direction, and when a force is applied to an opposite plate of the thrust bearing, the nut is assisted in rotating in an opposite direction.

22. The actuator of Claim 1, wherein the shaft is stationary.

23. The actuator of Claim 1, further including first and second end caps enclosing the cylinder.

24. The actuator of Claim 23, wherein the second end cap includes a clevis-type mounting.

25. The actuator of Claim 23, wherein the second end cap includes a side-facing mounting.

26. The actuator of Claim 25, further including a load piston inside the second end cap, the load piston being connected to the shaft.

27. The actuator of Claim 26, wherein the shaft and load piston are moveable axially.

28. The actuator of Claim 26, wherein a load sensing cavity is formed between the load piston and the second end cap, the cavity being filled with fluid.

29. The actuator of Claim 28, wherein the cavity further includes at least one spring providing a force biasing the load piston to ensure maximum fluid fill of the cavity.

30. The actuator of Claim 28, further including a load sensor connected to the load sensing cavity, the sensor configured to measure fluid pressure in the load sensing cavity and to provide an indication that the pressure piston is in the first position.

31. The actuator of Claim 28, the cavity further including a load piston gap configured such that if a fluid leakage occurs from the cavity and fluid pressure is thereby reduced, an indication that the pressure piston is in the first position will be lost but the pressure piston will still be in the first position.

32. The actuator of Claim 2, further including first and second end caps enclosing the cylinder.

33. The actuator of Claim 32, further including a position sensing device located on one or more of the pressure piston and the first end cap, the sensing device configured to detect and indicate when the pressure piston is in the first position.

34. The actuator of Claim 23, further including a position sensing device located on at least one of the pressure piston and the first end cap, the sensing device configured to detect and indicate when the pressure piston is in the second position.

35. The actuator of Claim 23, further including a rod protection tube connected to the first end cap.

36. The actuator of Claim 1, wherein the actuator is configured to be mountable to one or more of a rail vehicle brake cylinder, a rail vehicle truck and the body of a rail vehicle.

37. An actuator for a parking brake for a rail vehicle, the actuator being responsive to fluid signals to apply and release brakes on the vehicle, the actuator comprising:

a cylinder;

a pressure piston carried inside the cylinder;

a shaft;

a rod connected to the pressure piston, and the rod to be connected to a parking brake;

an apply port configured to receive a fluid pressure to move the pressure piston to an applied position; and

a locking mechanism inside the pressure piston, the locking mechanism including a first surface and a second surface, with both surfaces traveling with the pressure piston along the shaft in response to the fluid pressure at the apply port, and the surfaces locking the pressure piston and the parking brake of the vehicle in the applied position upon removal of the fluid pressure at the apply port.

38. The actuator of Claim 37, further including a release port configured to receive a fluid pressure, and, in response to the fluid pressure at the release port, the surfaces of the locking mechanism unlock and are configured to move along the shaft with the pressure piston to a released position, thereby releasing the parking brake of the vehicle.

39. The actuator of Claim 37, wherein the rod is moveable axially with respect to and concentrically over the shaft.

40. The actuator of Claim 37, wherein the first and second surfaces are axially opposed and axially engageable and disengageable.